Claims

1. Method for determining a gain spectrum (GS) for a Raman amplifier in a WDM transmission system, which is downstream from an optical fiber amplifier,
characterized in that
when the optical fiber amplifier is switched into the active state this causes mainly amplified spontaneous emission (ASE),
optical spectra (SPi) (i>1) at the output of the Raman amplifier are measured with the pumping sources with the Raman amplifier switched into the on and off states, and the gain spectrum (GS) is determined from these spectra (SPi).

2. Method in accordance with Claim 1
characterized in that
a first spectrum (SP1) is measured with the pumping source (PQ) for the Raman amplifier switched off and the pumping source for the optical fiber amplifier switched on,
a third spectrum (SP3) is measured with the pumping source PQ for the Raman amplifier switched on and the pumping source for the optical fiber amplifier switched on,
the gain spectrum (GS) for the Raman amplifier is calculated according to the following rule: $GS = \frac{SP3}{SP1}$.

3. Method in accordance with Claim 1
characterized in that
a first spectrum (SP1) is measured with the pumping source (PQ) for the Raman amplifier switched off and the pumping source for the optical fiber amplifier switched on,
a second spectrum (SP2) is measured with the pumping source PQ for the Raman amplifier switched on and the pumping source for the optical fiber amplifier switched off
a third spectrum (SP3) is measured with the pumping source PQ for the Raman amplifier switched on and the pumping source for the

optical fiber amplifier switched on,
the gain spectrum (GS) for the Raman amplifier is calculated according to the following rule: $GS = \frac{SP3 - SP2}{SP1}$..

4. Method in accordance with one of the Claims 1 to 3, characterized in that
for transmission links with additional optical fiber amplifiers and additional Raman amplifiers, further spectra are measured by switching their pumping sources on and off, and from this the gain spectra of the Raman amplifiers are determined.

5. Method in accordance with one of the preceding claims, characterized in that
during the commissioning of a transmission link with several sections, which contain at least one optical fiber amplifier and one Raman amplifier, the determination of the gain spectra (GS) is carried out section by section.

6. Method in accordance with one of the preceding claims, characterized in that
for the purpose of determining the gain spectrum (GS) the channel signals are attenuated so that a high level of amplified spontaneous emission (ASE) arises at the output of the optical fiber amplifier.

7. Arrangement for determining the gain spectrum (GS) of a Raman amplifier in a WDM transmission system, which is downstream from an optical fiber amplifier,
characterized in that
a control device (SE) is used to switch on and off the pumping sources for the Raman amplifier and to activate the optical fiber amplifier,
when the optical fiber amplifier is in the active state this causes mainly amplified spontaneous emission (ASE),
spectra (SPi) (i>1) generated with the Raman amplifier switched on

and off are measured at an optical spectrum analyzer (OSA) downstream from the Raman amplifier,
and from these spectra (SPi) the gain spectrum (GS) is determined.

8. Arrangement in accordance with Claim 7,
characterized in that
connected to the optical spectrum analyzer (OSA) are a unit (EE) for analyzing the spectra recorded by the optical spectrum analyzer (OSA) and a regulator (RE) for controlling the spectral power components of the pumping source (PQ).

9. Arrangement in accordance with Claim 7 or 8,
characterized in that
the optical fiber amplifier provided is an Erbium-doped fiber amplifier (EDFA1, EDFA2, ...), a semiconductor amplifier or a discrete Raman amplifier.

10. Arrangement in accordance with one of the Claims 7 to 9,
characterized in that
upstream from the optical fiber amplifier is an attenuation device (VOA) which, when a measurement is being made, suppresses channel signals (S1) so that a signal with a high level of amplified spontaneous emission (ASE) is fed to the Raman amplifier.